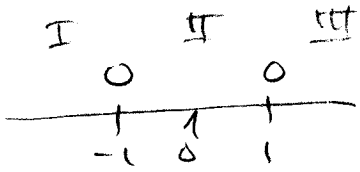
I Absolute Value

$\sqrt{\star^2} = |\star| = \begin{cases} \star & \text{if } \star < 0 \\ \star & \text{if } \star \geq 0 \end{cases}$

II A) $\left|\dfrac{x+1}{x-1}\right| \geq 3$



I $\dfrac{-(x+1)}{-(x-1)} \geq 3$

$-x-1 \geq -3x+3$

$2x \geq 4$

$x \geq 2$

Reject.

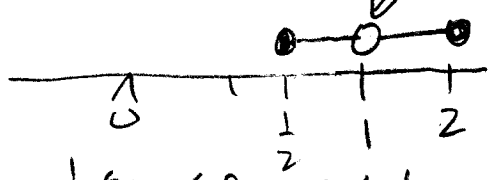
II $\dfrac{x+1}{-(x-1)} \geq 3$

$x+1 \geq -3x+3$

$4x \geq 2$

$x \geq \frac{1}{2}$

all right except -2



$\frac{1}{2} \leq x \leq 2;\ x \neq 1$

III $\dfrac{x+1}{x-1} \geq 3$

$x+1 \geq 3x-3$

$4 \geq 2x$

$2 \geq x$

II B) $\dfrac{x-2}{x^2-5x+6} \geq \dfrac{x-3}{x^2-6x+9}$

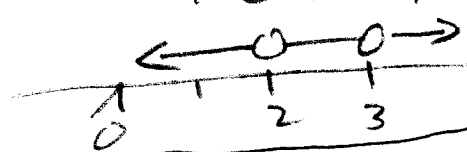
$\dfrac{\cancel{x-2}}{\cancel{(x-2)}(x-3)} \geq \dfrac{\cancel{x-3}}{(x-3)\cancel{(x-3)}}$

$\dfrac{1}{x-3} \geq \dfrac{1}{x-3}$

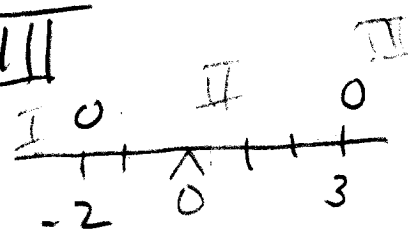
Identity, ie True

$x \in \mathbb{R}$ Right except conclusion -3

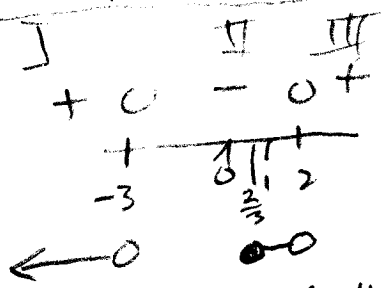
$x \notin \{2, 3\}$,



III



II C $\dfrac{1}{x-2} \geq \dfrac{4x+1}{(x-2)(x+3)}$



I $x+3 \geq 4x+1$

$2 \geq 3x$

$\frac{2}{3} \geq x$ and $x < 3$

so $x < 3$

If none $x-2<0$ -6

II $x+3 \leq 4x+1$

$2 \leq 3x$

$\frac{2}{3} \leq x$

$x < -3$ or

$\frac{2}{3} \leq x < 2$

III Same as I but x not in interval!. Reject

$f(x) = \begin{cases} -3x+5 & \text{if } x < -2 \\ -x+9 & \text{if } -2 \leq x < 3 \\ x+3 & \text{if } x \geq 3 \end{cases}$

III $f(x) = |x+2| - (x-4) + |x-3|$

I $-(x+2) - (x-4) - (x-3)$

$-x-2-x+4-x+3$

$-3x+5$

II $x+2-(x-4)-(x-3)$

$x+2-x+4-x+3$

$-x+9$

III $x+2-x+4+x-3$

$x+3$

IV $f(x) = \frac{x+1}{x-2}$ $g(x) = \frac{x+1}{(x+2)(x-3)}$

A) $A(x) = g(f(x))$

D_f $x \neq 2$

D_g $x \notin \{-2, 3\}$

D_A $x \notin \{2, 1, \frac{7}{2}\}$

$\frac{x+1}{x-2} \overset{set}{=} -2$

$x+1 = -2x+4$

$3x = 3$

$x = 1$

$\frac{x+1}{x-2} \overset{set}{=} 3$

$x+1 = 3x-6$

$7 = 2x$

$x = \frac{7}{2}$

B) $B(x) = \sqrt{\frac{1}{f} + \frac{1}{g}}$

$= \sqrt{\frac{x-2}{x+1} + \frac{(x+2)(x-3)}{x+1}}$

$= \sqrt{\frac{x-2+x^2-x-6}{x+1}}$

$= \sqrt{\frac{x^2-8}{x+1}}$ $x = \pm 2\sqrt{2}$

$-$ 0 $+$ 0 $+$ 0 $-$ 0 $+$

$-2\sqrt{2}$ -1 0 2 $2\sqrt{2}$

D_B $-2\sqrt{2} \leq x < -1$; or $x \geq 2\sqrt{2}$, $x \neq 3$

C) $C(x) = f(g(x))$

$C(x) = \frac{\frac{x+1}{(x+2)(x-3)} + 1}{\frac{x+1}{x^2-x-6} - 2}$

$C(x) = \frac{x+1+x^2-x-6}{x+1-2x^2+2x+12}$

$= \frac{x^2-5}{-2x^2+3x+13}$

V

A) $\frac{4\pi}{3}$ (1) 240° $(-\frac{1}{2}, -\frac{\sqrt{3}}{2})$

(2) $\frac{5\pi}{6}$ $(-\frac{\sqrt{3}}{2}, \frac{1}{2})$ 150°

B) 135 $\frac{3\pi}{4}$ $(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$

30° $(\frac{1}{2}, \frac{\sqrt{3}}{2})$ $\frac{\pi}{6}$

C) $(\frac{1}{2}, -\frac{\sqrt{3}}{2})$ $\frac{5\pi}{3}$ 300°

$(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$ $\frac{5\pi}{4}$ 225°

EXTRA.

$m = \frac{y_2 - y_1}{x_2 - x_1}$ $(m, 3)$ $(1, m)$

$\frac{m-3}{1-m} \overset{set}{=} m$

$\cancel{m} - 3 = \cancel{m} - m^2$

$m^2 = 3$ $m = \pm\sqrt{3}$

The slope could be $\sqrt{3}$ or $-\sqrt{3}$.

100↑	0
90	5
80	9
70	17
60	5
59↓	2

$\frac{2914}{38}$

76.7

38 students in 1 class does take its toll. I cannot get to each one for that one on one focus that I have been able to do in past years.

The bottom 7 need to go.

but the 70s probably should have been 80s under better teaching conditions.

9/13/2000

	4	5	T
100	1	3	4
90	3	10	13
80	12	10	22
70	2	3	5
60	4	3	7
59	5	3	8
	$\frac{2135}{28}$	$\frac{2656}{32}$	$\frac{4791}{60}$
	76.3	83.0	79.9

105

30

Large classes again. Better students possibly. Obviously a few need to drop. One change in lessons as mentioned in lesson plan otherwise an excellent unit.

9/16/97

100	1
90	8
80	11
70	9
60	5
59	4
	38

Great EXAM!!
No changes necessary.

$$\frac{2901}{37} = 78.4$$

Drop the 59 and 31
and get 80.3 ave.

Possible change — 1999

Delete II B and make
II 15 pts each.

It really tests the same
topic as II B, and C is the more difficult version.

	4	5	T	
100	0	3	3	104
90	0	3	3	
80	11	10	21	
70	13	6	19	
60	1	0	1	
59	3	3	6	23

$\frac{1996}{26}$ $\frac{2049}{25}$ $\frac{4045}{79.3}$

76.8 82.0

Honors Trigonometry Name TRIG Ch 1

Copy original problem. Per _____ Date ~~9/17/96~~ 99 97 2000

Convince *me* that you understand the concept!

Chapter 1 Exam

I Define Absolute Value. (5 pts)

II Solve. Graph solution on a properly labeled numberline. (10 pts ea)

a) $\left|\frac{x+1}{x-1}\right| \geq 3$ b) $\frac{x-2}{x^2-5x+6} \geq \frac{x-3}{x^2-6x+9}$ c) $\frac{1}{x-2} \geq \frac{4x+1}{(x-2)(x+3)}$

III Rewrite as a piece-wise function. $f(x) = |x+2| - (x-4) + |x-3|$ (10 pts)

IV Given: $f(x) = \frac{x+1}{x-2}$ and $g(x) = \frac{x+1}{(x+2)(x-3)}$ (10 pts ea)

a) Find the domain ONLY for $A(x) = g(f(x))$.

b) Find the domain ONLY for $B(x) = \sqrt{\frac{1}{f(x)} + \frac{1}{g(x)}}$.

c) Find the formula ONLY for $C(x) = f(g(x))$.

V For each of the following, list the three items including the given item. (x, y) is the coordinate pair on the unit circle, Z is the arc length in radians, and the Greek letter alpha (α) is the angle in degrees. Draw the circle for each. (NOTE: You will draw a total of 6 circles!) (25 pts total)

A) Find (x, y) and α given: 1) $z = \frac{4\pi}{3}$ 2) $z = \frac{5\pi}{6}$

B) Find (x, y) and Z given: 1) $\alpha = 135°$ 2) $\alpha = 30°$

C) Find Z and α given: 1) $\left(\frac{1}{2}, \frac{-\sqrt{3}}{2}\right)$ 2) $\left(\frac{-\sqrt{2}}{2}, \frac{-\sqrt{2}}{2}\right)$

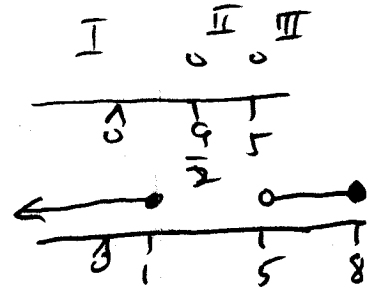
Extra Credit ---------- *5 pts* ----------

The points $(m, 3)$ and $(1, m)$ lie on a line with slope m. What is m?

I $\sqrt{\star^2} = |\star| = \begin{cases} -\star & \text{if } \star < 0 \\ \star & \text{if } \star \geq 0 \end{cases}$

II 4) $\dfrac{|9-2x|}{x-5} \leq \dfrac{7}{x-5}$

2 intervals
-4



I $9-2x \geq 7$

$2 \geq 2x$

$1 \geq x$

II

$-(9-2x) \geq 7$

$2x-9 \geq 7$

$2x \geq 16$

$x \geq 8$

Reject not in interval

III $-(9-2x) \leq 7$

$2x-9 \leq 7$

$2x \leq 16$

$x \leq 8$

$x \leq 1$ or $5 < x \leq 8$

B) $x(\frac{1}{2}x-1)-6 = -\frac{1}{2}$

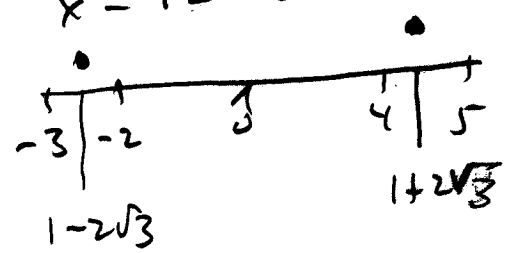
$x^2-2x-12 = -1$

$x^2-2x-11=0$

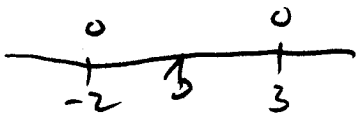
$x = \dfrac{2 \pm \sqrt{4+44}}{2}$ 48

$\dfrac{2 \pm 4\sqrt{3}}{2}$

$x = 1 \pm 2\sqrt{3}$



III $f(x) = |x+2| + |x-3|$



I $-(x+2)-(x-3)$

$-x-2-x+3$

$-2x+1$

II $x+2-(x-3)$

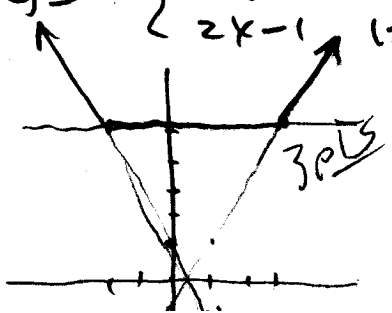
$x+2-x+3$

5

III $x+2+x-3$

$2x-1$

$f(x) = \begin{cases} -2x+1 & \text{if } x < -2 \\ 5 & \text{if } -2 \leq x < 3 \\ 2x-1 & \text{if } x \geq 3 \end{cases}$



IV $f(x) = \dfrac{x+2}{x-3}$ $g(x) = \dfrac{x-1}{x+1}$ $h(x) = \sqrt{x}$

A) $f(g(\frac{1}{3}))$

$g(\frac{1}{3}) = \dfrac{-\frac{2}{3}}{\frac{4}{3}} = -\frac{1}{2}$

$f(-\frac{1}{2}) = \dfrac{\frac{3}{2}}{-\frac{7}{2}} = -\dfrac{3}{7}$

B) $g(f(x)) = g\left(\dfrac{x+2}{x-3}\right)$

$= \dfrac{\frac{x+2}{x-3} - 1}{\frac{x+2}{x-3} + 1}$

$= \dfrac{\frac{x+2-x+3}{x-3}}{\frac{x+2+x-3}{x-3}}$

$\dfrac{5}{2x-1}$

IV c) D $f(f(h(x)))$ $x \geq 0$, $x \neq \{9, \frac{121}{4}\}$

$\sqrt{x} \overset{set}{=} 3$

$x = 9$

$\frac{x+2}{x-3} \overset{set}{=} 3$

$x+2 = 3x-9$

$11 = 2x$

$\frac{11}{2} = x$

$\sqrt{x} \overset{set}{=} \frac{11}{2}$

$x = \frac{121}{4}$

-3 (if not included)

D) $h(f(x))$

$\frac{x+2}{x-3} > 0$

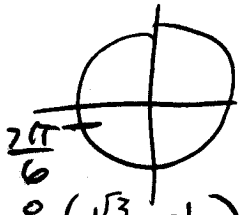
$+ \; 0 \; - \; 0 \; +$

$-2 \quad 3 \quad 3$

$x \leq -2$ or $x > 3$

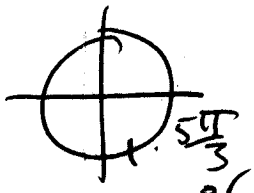
V

(A)



$\frac{7\pi}{6}$

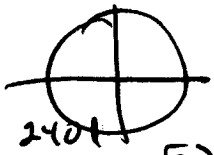
$210°, \left(-\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$



$\frac{5\pi}{3}$

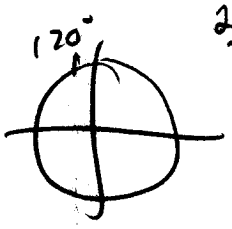
$300° \left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$

(B)



$240°$

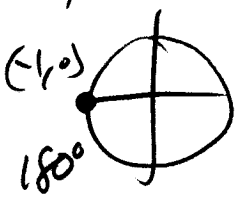
$\frac{4\pi}{3}, \left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$



$120°$

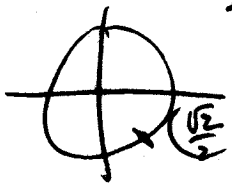
$\frac{2\pi}{3} \left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

(C)



$(-1, 0)$

$\pi \; 180°$



$\frac{7\pi}{4}, \; 315°$

$\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$

Extra credit

The probability that it will rain of the weekend" is "1 − (it won't rain of Sat)(it won't rain on Sunday)"

won't rain SAT $\left(1 - \frac{2}{5}\right)$

won't rain Sun $\left(1 - \frac{1}{5}\right)$

$\frac{3}{5} \cdot \frac{4}{5} = \frac{12}{25} \rightarrow 48\%$

$1 - 48\% = 52\%$ it will rain on the weekend.

9/12/2001

	3	5	T
100↑	1	0	1
90	7	6	13
80	9	12	21
70	5	9	14
60	2	2	4
59	2	0	2
	26	~~29~~ 30	

104

40

$\frac{2087}{25}$ $\frac{2396}{30}$

81.5

~~83.5~~ ~~79.9~~ 80.8

Excellent exam results. This was a good opener for them. I didn't really try and I was out for medical and tried to catch up. That one may still be a keeper.

9/16/1998

	4	5	T
100↑	0	0	0
90	4	3	7
80	14	13	27
70	8	8	16
60	2	2	4
59	4	0	4

96

57

$\frac{2449}{32}$ $\frac{2120}{26}$ $\frac{4614}{58}$

779 81.5 79.6

Great exam

92	2	5	T	
100	0	0	0	97
90	3	3	6	
80	9	11	20	
70	6	8	14	
60	5	2	7	
59	3	1	4	50

1988	2008	3996
24	25	51
76.5	80.32	78.4

Excellent choice of Problems.

II A. Evaded everyone. Now, they will be watching when I show solutions and point out that I am applying the same rules I have been talking about for 2 weeks.

The Quizzed were perfect. They really set the EXAM up. I would like to have students take Monday's Quiz with them to study. Maybe "read off your Quiz score" at the end of class.

1995

	8	6	T
100 ↑	0	0	0
90	10	5	15
80	13	14	27
70	4	8	12
60	0	2	2
59	0	0	0

95

63

Great problems.

EXTRA credit doesn't have much in the way of partial credit.

but I guess that's OK.

Quizes were essential.

Extra day lays than 94 paid off too.

$\frac{2319}{27}$	$\frac{2384}{29}$	$\frac{4703}{56}$
85.89	82.21	83.98

Honors Trigonometry

Copy original problem.

Convince *me* that **you** understand the concept!

Name Trig ch 1

Per _____ Date ~~9/12/01~~ 9/19/98

Chapter 1 Exam

6

I Define Absolute Value. (5 pts)

II Solve. Graph solution on a properly labeled numberline. (15 pts ea)

A) $\dfrac{|9 - 2x|}{x - 5} \le \dfrac{7}{x - 5}$

B) $x\left(\frac{1}{2}x - 1\right) - 6 = -\frac{1}{2}$

III Rewrite as a piece-meal function. Graph: $f(x) = |x + 2| + |x - 3|$ (15 pts)

IV Given: $f(x) = \dfrac{x + 2}{x - 3}$, $g(x) = \dfrac{x - 1}{x + 1}$, and $h(x) = \sqrt{x}$ (5 pts ea)

a) Find the value of $f\left(g\left(\frac{1}{3}\right)\right)$.

b) Find the **formula** ONLY for $g(f(x))$.

c) Find the **domain** ONLY for $f(f(x))$.

d) Find the **domain** ONLY for $h(f(x))$.

V For each of the following, list the three items including the given item. (x , y) is the coordinate pair on the unit circle, Z is the arc length in radians, and the Greek letter alpha (α) is the angle in degrees. Draw the circle for each.
(NOTE: You will draw a total of 6 circles!) (25 pts total)

A) Find (x , y) and α given: 1) $z = \dfrac{7\pi}{6}$ 2) $z = \dfrac{5\pi}{3}$

B) Find (x , y) and Z given: 1) $\alpha = 240°$ 2) $\alpha = 120°$

C) Find Z and α given: 1) $(-1, 0)$ 2) $\left(\dfrac{\sqrt{2}}{2}, -\dfrac{\sqrt{2}}{2}\right)$

Extra Credit ---------- *5 pts*

If the chances of rain are 40 percent on Saturday and 20 percent on Sunday, what is the chance that it will rain during the weekend?

I $f(x) = \frac{2x-1}{x+2}$ $g(x) = \frac{2x-1}{x-3}$ $h(x) = \frac{1}{(2x-1)(x+1)}$

D_f $x \neq -2$ D_g $x \neq 3$ D_h $x \notin \{\frac{1}{2}, -1\}$

10 pts A) $A(x) = h(g(x))$

$\frac{2x-1}{x-3} \overset{set}{=} \frac{1}{2}$

$4x-2 = x-3$

$3x = -1$

$x = \frac{-1}{3}$

$\frac{2x-1}{x-3} \overset{set}{=} -1$

$2x-1 = -x+3$

$3x = 4$

$x = \frac{4}{3}$

D_A $x \notin \{3, \frac{-1}{3}, \frac{4}{3}\}$

10 pts B) $B(x) = \frac{1}{\frac{1}{f}+\frac{1}{g}}$

$\frac{1}{f}+\frac{1}{g} = \frac{x+2}{2x-1} + \frac{x-3}{2x-1}$

$\frac{2x-1}{2x-1} = 1$ must simplify to this

2 pts

D_B $x \notin \{\frac{1}{2}, -2, 3\}$

10 pts C) $C(x) = \sqrt{-\frac{f}{g}}$

$\frac{f}{g}$ $\frac{\frac{2x-1}{x+2}}{\frac{2x-1}{x-3}} = \frac{x-3}{x+2}$

$-$ 0 $+$ 0 $+$

-2 0 $\frac{1}{2}$ 3

no # lim -4

D_C $-2 < x < 3$; $x \neq \frac{1}{2}$ 2 pts

10 pts D) $D(x) = f(g(x))$

$f\left(\frac{2x-1}{x-3}\right) = \frac{2\left(\frac{2x-1}{x-3}\right)-1}{\frac{2x-1}{x-3}+2}$ to lim -4

$\frac{4x-2-x+3}{2x-1+2x-6}$

$\frac{3x+1}{4x-7}$

II 10 pts A) $\frac{1}{2x-3} \leq 4$

0 $\frac{3}{2}$ $\frac{13}{8}$

not 2 cases -5

I

$1 \geq 8x-12$

$13 \geq 8x$

$\frac{13}{8} \geq x \therefore x < \frac{3}{2}$

II

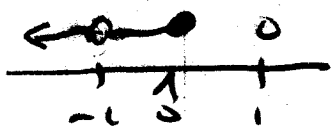
$x \geq \frac{13}{8}$

$x < \frac{3}{2}$

or

$x \geq \frac{13}{8}$

II B) $\dfrac{|x-1|}{|x+1|} \geq 1$



$x \leq 0;\ x \neq -1$

10 pts

I $\dfrac{-(x-1)}{-(x+1)} \geq 1$

$x-1 \leq x+1$

$-1 \leq 1$

II $\dfrac{-(x-1)}{x+1} \geq 1$

$-x+1 \geq x+1$

$0 \geq 2x$

$0 \geq x$

III $\dfrac{x-1}{x+1} \geq 1$

$x-1 \geq x+1$

$-1 \geq 1$

reject.

c) $2x(x-6)+1=-7$

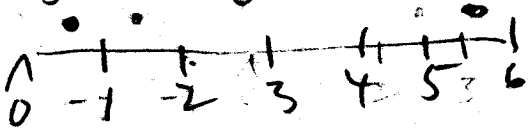
$2x^2-12x+8=0$

$x^2-6x+4=0$

$x = \dfrac{6 \pm \sqrt{36-16}}{2}$

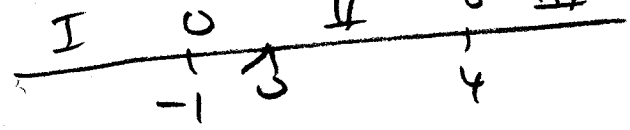
10 pts $x = \dfrac{\ \pm 2\sqrt{5}}{2}$

$3-\sqrt{5}$ $3 \pm \sqrt{5}$ $3+\sqrt{5}$



III $f(x) = |x+1| - |x-4|$

I 0 II 0 III



I $-(x+1)+x-4$

$-x-1+x-4$

-5

II $+(x+1)+x-4$

$2x-3$

III $x+1-x+4$

5

IV circle w/ 20 pts ~~coord~~, Radians & Degrees

$\begin{cases} \frac{1}{2}x + \frac{5}{4}y = \frac{11}{4} \\ \frac{2}{3}x + \frac{1}{2}y = \frac{1}{6} \end{cases}$

$\begin{cases} 2x+5y=11 \\ 4x+3y=1 \end{cases}$

$-4x-10y=-22$

$-7y=-21$

$y=3$

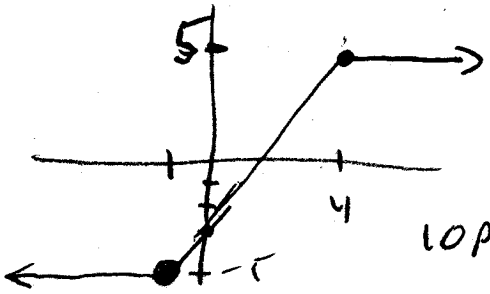
$2x+15=11$

$2x=-4$

$x=-2$

$(-2, 3)$

5 pts.



10 pts

$f(x) = \begin{cases} -5 & \text{if } x < -1 \\ 2x-3 & -1 \leq x < 4 \\ 5 & \text{if } x \geq 4 \end{cases}$

	2	3	T	
100	0	0	0	97
90	7	1	8	
80	7	3	10	
70	8	10	18	
60	3	10	13	
59	4	5	9	
				34

$\frac{2214}{29}$ $\frac{1975}{29}$

76.3 68.1 72.2

I forgot the def of abs value for 1st question

I would have made Part IV only 15 pts to make it fit.

I don't really like IB because students get the answer without really the fractions drop out

Honors Trigonometry

Copy original problem.

Convince *me* that **you** understand the concept!

No Calculator. No decimal answers accepted.

Name Trig ch 1

Per _____ Date 2002

Chapter 1 Exam

I Given $f(x) = \dfrac{2x - 1}{x + 2}$, $g(x) = \dfrac{2x - 1}{x - 3}$ and $h(x) = \dfrac{1}{(2x - 1)(x + 1)}$ (10 pts ea)

a) $A(x) = h(g(x))$. Find D_A

b) $B(x) = \dfrac{1}{\dfrac{1}{f(x)} + \dfrac{1}{g(x)}}$. Find D_B

c) $C(x) = \sqrt{-\dfrac{f(x)}{g(x)}}$. Find D_C.

d) $D(x) = f(g(x))$. Find the formula for $D(x)$.

II Solve for all x where x is a real number.
Graph solution on a number line as well as stating it in proper mathematical notation.. (10 pts ea)

a) $\dfrac{1}{2x - 3} \le 4$

b) $\dfrac{|x - 1|}{|x + 1|} \ge 1$

c) $2x(x - 6) + 1 = -7$

III Write as a "piece wise" function. Sketch the graph: $f(x) = |x + 1| - |x - 4|$ (10 pts)

IV On a fresh sheet of paper, draw an axis and a large circle centered on the axis. Locate and mark the position with coordinate (1, 0). Locate and mark each of the multiples of 30 degrees and 45 degrees which we use on the circle all the way around. At each of these "convenient locations" label with the angle in degrees, the radian measure of that spot and the coordinates on the unit circle of that spot.
(20 pts tot)

Extra Credit ---------- *5 pts* ----------

Solve for (x, y) : $\begin{cases} \frac{1}{2}x + \frac{5}{4}y = \frac{11}{4} \\ \frac{2}{3}x + \frac{1}{2}y = \frac{1}{6} \end{cases}$

HONORS TRIG 2002

CHAPTER # 1

School Holiday

9 / 2

Read ONLY Pg 356-361
then do
"Remember When ..."
Parts I, II
#1

9 / 3

R/C Pg 361 - 362
#2

#3 "RW..." Part III
No Decimals

9 / 4

#4 "RW..." Part IV
1 - 8
Important Lecture

$$\sqrt{\bigstar^2} = |\bigstar| = \begin{cases} -\bigstar & ; \ \bigstar < 0 \\ \bigstar & ; \ \bigstar \geq 0 \end{cases}$$

9 / 5

#5, #6
"RW..." Part IV
9 - 21

9 / 6

#7 "RW..." Part V

9/9

8 "RW..."
Part VI

The good news is that we actually start some Trig tomorrow!

#9 R/C Pg 1 - 5

#10 RW VII
also Pg 3-4 1 - 6
replace text instructions with:
find the fundamental period ***and*** find
$f(23)$, and $f(-7)$

#11 **pg 8**: See instructions listed elsewhere on this sked.

9/11

#12 Pg 13 - 14
No Decimals!
1– 4, 17 – 22

9/12

MORE EL QUIZZOS

#13
Write a narrative of *"how to do"* problems from *Remember When.* Part V #1 & 6, Part VI B3 & C2, Part VII #15
Still more quizzes!!!!!!
Tomorrow:
We put Last Year's Exam on the Boards

9/16

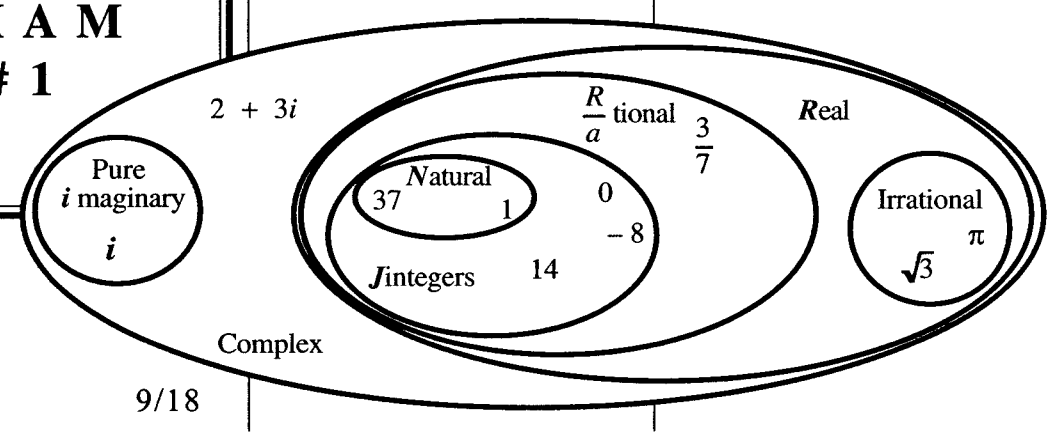
For assignment #11: Write each in the form of: "an even number (positive or negative) times π plus another number which is *positive* and less than 2π"

eg $\frac{37\pi}{5} = 6\pi + \frac{7\pi}{5}$

#11 Pg 8 1 – 10

9/17

EXAM # 1



9/18

5 I $|\star| = \begin{cases} \star & \text{if } \star \geq 0 \\ -\star & \text{if } \star < 0 \end{cases}$

II $f(x) = \frac{1}{x-1}$ $\quad G(x) = \frac{2x}{x+2}$

5A) $G(f(x)) = G\left(\frac{1}{x-1}\right) = \dfrac{2\left(\frac{1}{x-1}\right)}{\frac{1}{x-1}+2}$

$= \dfrac{\frac{2}{\cancel{x-1}}}{\frac{1+2x-2}{\cancel{x-1}}} = \dfrac{2}{2x-1}$

5B) $D_{g(g(x))}$ $x \neq \{-2, -1\}$ 2pts

$\frac{2x}{x+2} \overset{\text{set}}{=} -2$

$2x = -2x - 4$

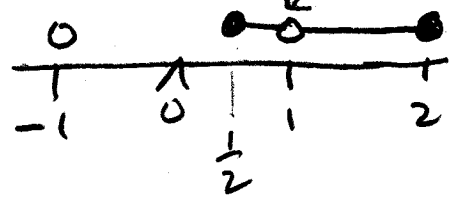
$4x = -4$

$x = -1$

III A) $\left|\frac{x+1}{x-1}\right| \geq 3$

10 pts ea

2pts



I $\frac{x+1}{x-1} \geq 3$

$x+1 \leq 3x-3$

$4 \leq 2x$

$2 \leq x$ reject $x < -1$

II $\frac{x+1}{-(x-1)} \geq 3$

$x+1 \geq -3x+3$

$4x \geq 2$

$x \geq \frac{1}{2}$

III

$\frac{x+1}{x-1} \geq 3$

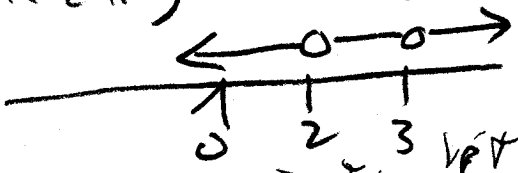
$2 \geq x$

III B $\frac{x-2}{x^2-5x+6} = \frac{x-3}{x^2-6x+9}$

$\frac{\cancel{x-2}}{(\cancel{x-2})(x-3)} = \frac{\cancel{x-3}}{(\cancel{x-3})(x-3)}$

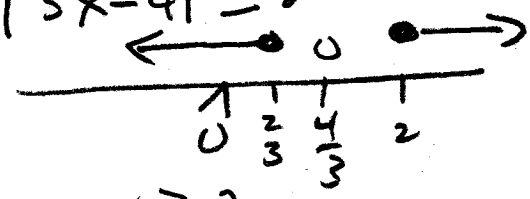
Identity.

$x \in \mathbb{R},\ x \neq \{2, 3\}$



2 pts 1pt

III C) $|3x-4| \geq 2$



$-3x+4 \geq 2$

$-3x \geq -2$

$x \leq \frac{2}{3}$

$3x-4 \geq 2$

$3x \geq 6$

$x \geq 2$

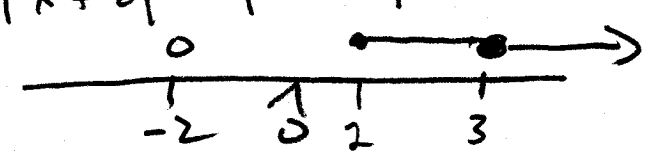
III D $|5x+4| = -3$

Reject.

$|\star| \geq 0\ \forall \star$

$\therefore$ Never $= \forall\ \# < 0$.

III E) $|x+2| - |x-3| \geq 3$



I $-x-2+x-3 \geq 3$

$-5 \geq 3$ Reject

II $x+2+x-3 \geq 3$

$2x \geq 4$

III E cont.

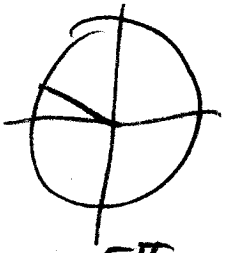
III $x+2-x+3\geq 3$

$5\geq 3$

True $\forall x>3$

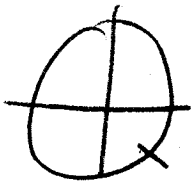
IV total 25

A 1) $\alpha=150$ 2) $\alpha=315$



$z=\frac{5\pi}{6}$

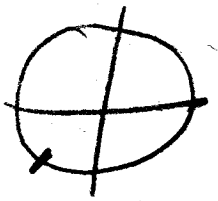
$\left(-\frac{\sqrt{3}}{2},\frac{1}{2}\right)$



$z=\frac{7\pi}{4}$

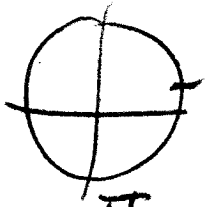
$\left(\frac{\sqrt{2}}{2},-\frac{\sqrt{2}}{2}\right)$

B 1) $-\frac{\sqrt{2}}{2},-\frac{\sqrt{2}}{2}$ 2) $\frac{\sqrt{3}}{2},\frac{1}{2}$



$z=\frac{5\pi}{4}$

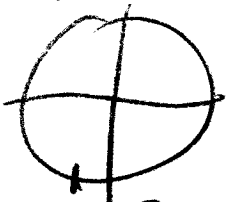
$\alpha=225^\circ$



$z=\frac{\pi}{6}$

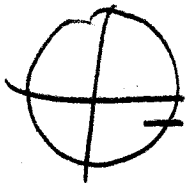
$\alpha=30^\circ$

C) 1) $z=\frac{4\pi}{3}$. 2) $z=\frac{11\pi}{6}$



$-\frac{1}{2},-\frac{\sqrt{3}}{2}$

$\alpha=240^\circ$



$\frac{\sqrt{3}}{2},-\frac{1}{2}$

$\alpha=330^\circ$

III F $(x-5)^2=10$

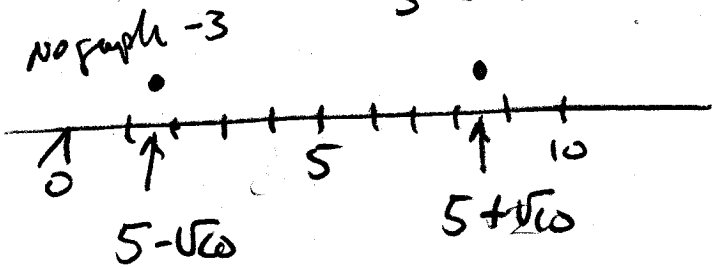
$x^2-10x+25-10=0$

$x^2-10x+15=0$

$x=\frac{+10\pm\sqrt{100-60}}{2}$

$x=\frac{10\pm 2\sqrt{10}}{2}=5\pm\sqrt{10}$

$3<\sqrt{10}<4$



EXTRA

$f(x)=\left(\frac{x+1}{x-3}\right)^2$, $g(x)=4$

$h(x)=\frac{x-5}{x+7}$, $J(x)=f(g(h(x)))$

$J=\left(\frac{4+1}{4-3}\right)^2=25$

D_J $x\neq -7$

I need to put solutions
(at least the graphs of them)
~~on~~ from Absolute Value
graphing problems on board
so students can check
their work

	2	5	T
100	1	2	3
90	14	9	23
80	8	12	20
70	3	3	6
60	2	0	2
59	1	2	3
	85.96	85.28	85.63

102

27

Graded
very easy.
generally
2 pts off
for problems in III

1985

1989

	2	5	T
100	0	1	1
90	9	8	17
80	11	7	18
70	6	3	9
60	0	0	0
59	0	2	2
	86.0	84.9	85.5

103

52

make changes shown on reverse side.

timing was perfect.

a few (< 4) students scored a little low (in 70s) because of class changes made late.

the 2 f's were really not a real surprise.

HONORS TRIGONOMETERY
Copy original problem. SHOW ALL WORK !

NAME Ch 1 1989

PER _____ DATE 9/19/89

CHAPTER 1 EXAM

also 85

I Define Absolute Value (5 pts)

II Given $F(x) = \dfrac{1}{x-1}$ and $G(x) = \dfrac{2x}{x+2}$ (5 pts ea.)

A) Find the formula for : $G(F(x))$

B) Find the DOMAIN ONLY of $G(G(x))$

III Solve $\forall x \in \mathbb{R}$ ALSO graph each solution on a NUMBER LINE. (10 pts ea.)

A) $\dfrac{|x+1|}{|x-1|} \geq 3$

B) $\dfrac{x-2}{x^2-5x+6} = \dfrac{x-3}{x^2-6x+9}$

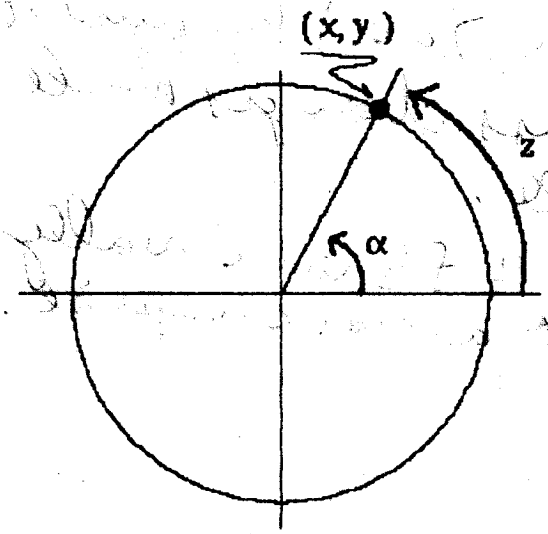
C) $|3x-4| \geq 2$

D) $|5x+4| = -3$

E) $|x+2| - |x-3| \geq 3$

F) $(x-5)^2 = 10$

IV For each of the following, draw the corresponding circle find the indicated items using the given item. (x, y) are the coordinates on the unit circle, z is the arc length (radians) and α is the angle in degrees. The diagram on the right is intended ONLY as an aid. Total value of this section is 25 points.



A) Find (x, y) and z given :

1) $\alpha = 150^\circ$ 2) $\alpha = 315^\circ$

B) Find z and α given :

1) $\left(-\dfrac{\sqrt{2}}{2}, -\dfrac{\sqrt{2}}{2}\right)$ 2) $\left(\dfrac{\sqrt{3}}{2}, \dfrac{1}{2}\right)$

C) Find (x, y) and α given :

1) $z = \dfrac{4\pi}{3}$ 2) $z = \dfrac{11\pi}{6}$

EXTRA CREDIT ---------- 5 pts ----------

Given $F(x) = \left(\dfrac{x+1}{x-3}\right)^2$, $G(x) = 4$, $H(x) = \dfrac{x-5}{x+7}$ and $J(x) = F(G(H(x)))$.

Find the formula for $J(x)$ AND find D_J . (ie. its domain also)

I $|\star| = \begin{cases} \star & \text{if } \star \geq 0 \\ -\star & \text{if } \star < 0 \end{cases}$

II $f(x) = \dfrac{x+1}{x-2}$ $\quad G(x) = \dfrac{x}{x+1}$

A) $H(x) = f(g(x)) = \dfrac{\frac{x}{x+1}+1}{\frac{x}{x+1}-2}$

$= \dfrac{\frac{x+x+1}{\cancel{x+1}}}{\frac{x-2x-2}{\cancel{x+1}}}$

$= \dfrac{2x+1}{-x-2}$

B) $J(x) = \dfrac{f(x)}{g(x)}$

D_J $x \neq \{-1, 2, 0\}$

$\dfrac{x}{x+1} \overset{\text{set}}{=} 0$

$x = 0$

C) $K(x) = G(G(x))$

D_K $x \neq \{-1, -\frac{1}{2}\}$

$\dfrac{x}{x+1} \overset{\text{set}}{=} -1$

$x = -x-1$

$2x = -1$

$x = -\frac{1}{2}$

D) $f(f(5))$

$f(5) = \dfrac{5+1}{5-2}$

$= \dfrac{6}{3}$

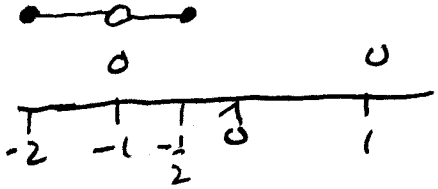
$= 2 \leftarrow$ STOP here

$f(2)$ DNE

$f(f(5))$ DNE

III

A) $\dfrac{|x-1|}{|x+1|} \geq 3$



I $\dfrac{-(x-1)}{-(x+1)} \geq 3$

$-x+1 \geq -3x-3$

$2x \geq -4$

$x \geq -2$

II $\dfrac{-(x-1)}{x+1} \geq 3$

$-x+1 \geq 3x+3$

$-2 \geq 4x$

$-\frac{1}{2} \geq x$

III $\dfrac{x-1}{x+1} \geq 3$

$x-1 \geq 3x+3$

$-4 \geq 2x$

$-2 \geq x$

Reject wrong interval

B) $\dfrac{2x^2+4x}{x^2+5x+6} = x-2$

$\dfrac{2x\cancel{(x+2)}}{(x+3)\cancel{(x+2)}} = x-2$

$2x = x^2+x-6$

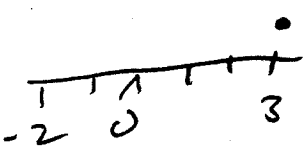
$x^2-x-6=0$

$(x-3)(x+2)=0$

$x \in \{-2, 3\}$

Reject $x=-2$

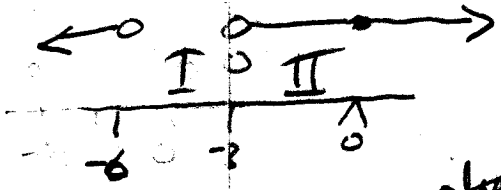
$x=3$ only solution.



2 PTS

III

c) $\frac{x}{x+3} < 2$



I $x > 2x+6$

$-6 > x$

II $x < 2x+6$

$-6 < x$

only II

IV D) $(x-3)^2 = 12$

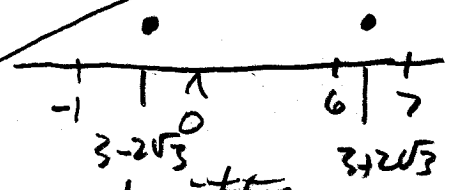
$x-3 = \pm 2\sqrt{3}$

$x = 3 \pm 2\sqrt{3}$

$2\sqrt{3} = \sqrt{12}$ which is clearly between 3 & 4.

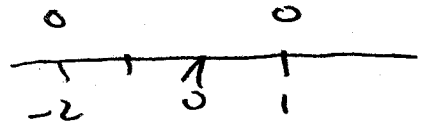
~~change to decimals~~

~~stuck with two hard to estimate fractions.~~



NO

IV $f(x) = |x+2| + |x-1|$ $-3 \le x \le 3$



I $-(x+2) - (x-1)$

$-x-2-x+1$

$-2x-1$

II $x+2-x+1$

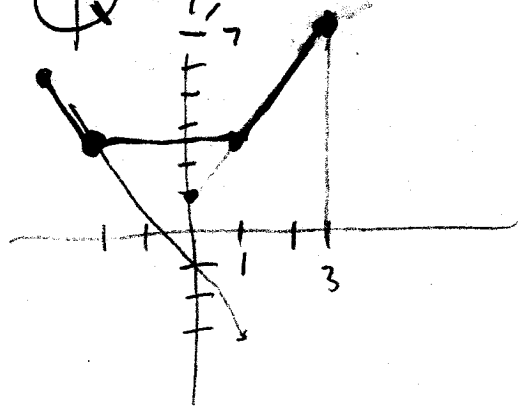
3

III $x+2+x-1$

$2x+1$

$$f(x) = \begin{cases} -2x-1 & \text{if } -3 \le x < -2 \\ 3 & \text{if } -2 \le x < 1 \\ 2x+1 & \text{if } 1 \le x \le 3 \end{cases}$$

graph



V

A) ① II $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ $30°$

② $\frac{5\pi}{3}$ $\left(\frac{1}{2}, \frac{-\sqrt{3}}{2}\right)$ $300°$

B) ① $150°$ $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ $\frac{5\pi}{6}$

② $240°$ $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$ $\frac{4\pi}{3}$

C) ① $\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$ $\frac{2\pi}{3}$, $120°$

② $\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$ $\frac{7\pi}{4}$, $315°$

Extra

$\frac{b}{a} = 2$ $\frac{c}{b} = 3$

$\frac{a+b}{b+c} = ?$

$b = 2a$

$c = 3b$

$c = 3(2a) = 6a$

$\frac{a+b}{b+c} = \frac{a+2a}{2a+6a} = \frac{3a}{8a} = \frac{3}{8}$

1992

	2	5	T
100	0	0	0
90	12	7	19
80	8	14	22
70	5	5	10
60	0	1	1
59	0	1	1
	87.9	84.3	86.0

96

59

the 68 didn't finish –
he said he knew he needed
to work faster next last
track of time –
the 59 skipped 30 pts
worth of phlms.
all of these may be
keepers.

1993

	2	5	7
100	1	1	2
90	12	8	20
80	6	8	14
70	3	3	6
60	1	2	3
59	0	2	2

101

56

$\frac{2006}{23}$ $\frac{2003}{24}$ $\frac{4009}{47}$

87.2 83.5 85.3

Excellent opener EXAM.

I had a weak presentation (or none at all) on periodic fctns

One nice thing would be to put pictures (#line graphs) and/or cartesian graphs of solutions on Back of HW sked. ... might be too much work .... Have to think about it.

Honors Trigonometry
Copy the original problem.
Convince *me* that **you** understand the concept.

Name Trig C1 9/18/90

Per _____ Date 93

I Define *Absolute Value.* (5 pts)

II Given: $F(x) = \dfrac{x+1}{x-2}$ and $G(x) = \dfrac{x}{x+1}$ (5 pts ea)

A) Find the *formula* for $H(x) = F(G(x))$.

B) Find the Domain *ONLY* for $J(x) = \dfrac{F(x)}{G(x)}$.

C) Find the Domain *ONLY* for $K(x) = G(G(x))$.

D) Find the value of $F(F(5))$.

III Solve $\forall\ x\ \varepsilon\ R$. Graph solution set on a numberline. (10 pts ea)

A) $\dfrac{|x-1|}{|x+1|} \geq 3$ B) $\dfrac{2x^2+4x}{x^2+5x+6} = x-2$ C) $\dfrac{x}{x+3} < 2$

D) $(x-3)^2 = 12$

IV Given : $F(x) = |x+2| + |x-1|$ with domain: $-3 \leq x \leq 3$. Rewrite F (x) as a piece-meal function. (10 pts)

V For each of the following, list the three items including the given item. (x,y) is the coordinate pair on the unit circle, *Z* is the arc length in radians, and the Greek letter alpha (α) is the angle in degrees. Draw the circle for each. (25 pts total)

A) Find (x, y) and α given: 1) $Z = \dfrac{\pi}{6}$ 2) $Z = \dfrac{5\pi}{3}$

B) Find (x, y) and Z given: 1) $\alpha = 150°$ 2) $\alpha = 240°$

C) Find Z and α given: 1) $\left(-\dfrac{1}{2}, \dfrac{\sqrt{3}}{2}\right)$ 2) $\left(\dfrac{\sqrt{2}}{2}, -\dfrac{\sqrt{2}}{2}\right)$

EXTRA CREDIT ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪ **5 pts** ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪

If $\dfrac{b}{a} = 2$ and $\dfrac{c}{b} = 3$, what is the numeric ratio of $a+b$ to $b+c$?

I $|\star| = \begin{cases} \star & \text{if } \star \geq 0 \\ -\star & \text{if } \star < 0 \end{cases}$

II $f(x) = \dfrac{x+2}{x-3}$ $\quad G(x) = \dfrac{2}{x+3}$

A) D_f $x \neq 3$ $\quad D_G$ $x \neq -3$

B) D_H $x \neq \{\pm 3\}$

C) D_J $x \neq \{-2, \pm 3\}$

D) D_K $x \neq \{-3, -\frac{7}{3}\}$

E) D_L $x \neq \{\pm 3, -4\}$

F) $G(f(x)) =$

$$\frac{2}{\frac{x+2}{x-3} + 3} =$$

$$\frac{2}{\frac{x+2+3x-9}{x-3}}$$

$$\frac{2x-6}{4x-7}$$

$$\frac{2}{x+3} \overset{\text{set}}{=} 3$$

$2 = 3x + 9$

$-7 = 3x$

$x = -\frac{7}{3}$

$$\frac{x+2}{x-3} - \frac{2}{x+3}$$

$$\frac{x^2+5x+6-2x+6}{x^2-9} \overset{\text{set}}{=} 0$$

$x^2 + 3x + 12 = 0$

$x = \frac{-3 \pm \sqrt{9-48}}{2}$

reject.

No extra restrictions

II

$$\frac{-(x-2)}{x+3} \geq 1$$

$-x + 2 \geq x + 3$

$-1 \geq 2x$

$-\frac{1}{2} \geq x$

III

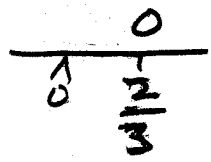
$$\frac{x-2}{x+3} \geq 1$$

$x - 2 \geq x + 3$

$-2 \geq 3$

Reject.

III A) $\dfrac{1}{3x-2} < 4$



I

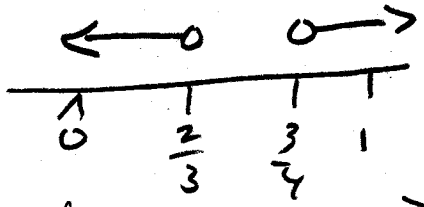
$1 > 12x - 8$

$9 > 12x$

$\frac{3}{4} > x$

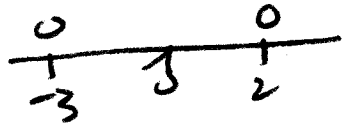
II $1 < 12x - 8$

$x > \frac{3}{4}$



Conclusion $x < \frac{2}{3}$ or $x > \frac{3}{4}$

III B $\left|\dfrac{x-2}{x+3}\right| \geq 1$

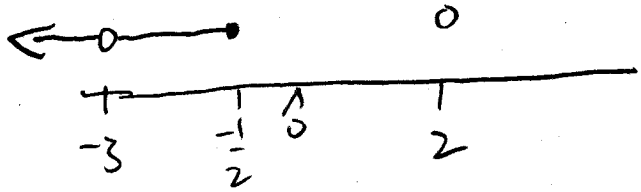


I $\dfrac{x-2}{x+3} \geq 1$

$x - 2 \leq x + 3$

$-2 \leq 3$ True

all of interval I



$x < -\frac{1}{2}$; $x \neq -3$

III c

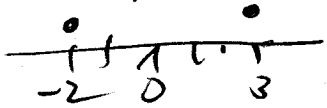
$$\frac{2x}{x+3} = x-2$$

$$2x = x^2 + x - 6$$

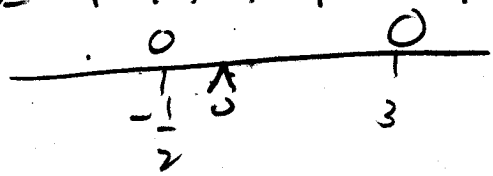
$$x^2 - x - 6 = 0$$

$$(x-3)(x+2) = 0$$

$$x \in \{3, -2\}$$



IV $f(x) = |2x+1| - |3-x|$



$$f(x) = \begin{cases} -x-4 & \text{if } x < -\frac{1}{2} \\ -\frac{7}{2} & \text{if } x = -\frac{1}{2} \\ 3x-2 & \text{if } -\frac{1}{2} < x < 3 \\ 7 & \text{if } x = 3 \\ x+4 & \text{if } x > 3 \end{cases}$$

I $-(2x+1) - (3-x)$

$-2x - 1 - 3 + x$

$-x - 4$

II $2x+1-(3-x)$

$2x+1-3+x$

$3x-2$

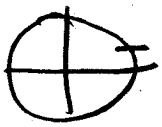
III $2x+1+(3-x)$

$x+4$

V

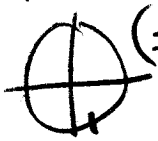
1

A) $\frac{\pi}{6}$



$\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ 30°

2



$\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$

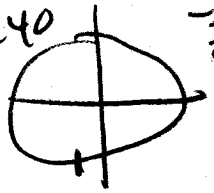
300°

B) 1

150° $\frac{5\pi}{6}$ $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

2

240°

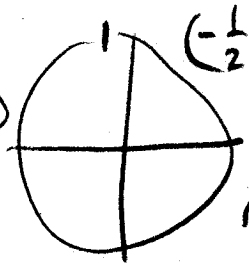


$\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$

$\frac{4\pi}{3}$

C)

1

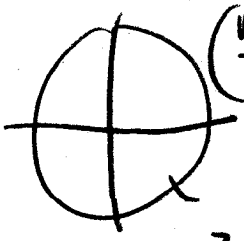


$\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

$\frac{2\pi}{3}$

120°

2



$\left(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$

$\frac{7\pi}{4}$

315°

Extra.

$$J(x) = \{(1,3)\ (2,2)\ (3,4)\ (4,1)\}$$

I E) I come close but the problem ended up being trivial. This problem should be replaced with something like:

$$L(x) = \sqrt{f+g}$$ or something similar.

	2	5	T
100	0	1	105
90	5	9	
80	5	5	
70	5	5	
60	0	0	
59	2	5	39
	82.4	79.5	80.61

$\frac{16}{}$ $\frac{1987}{25}$

The bottom? are a real mystery! did they really sign up for Honors Trig? maybe some will see that they have to do more than watch me — they will have to do some themselves.

1994

I Identify "bondering integers" in III (especially part C)

add 1 day to This unit. See adjusted sked in Note book.

use STARS on def of Abs Value on HW sked.

	5	6	T
100	0	0	0
90	4	6	
80	12	5	
70	8	8	
60	4	1	
59	1	1	

99

48

$\frac{2315}{29}$ $\frac{1724}{21}$ $\frac{4039}{50}$

79.83 82.09 80.78

Honors Trigonometry
Copy the original problem.
Convince *me* that you understand the concept.

Name TRIG Ch 1 94

Per _____ Date _____ 94

I Define *Absolute Value*. **(5 pts)**

II Given: $f(x) = \dfrac{x+2}{x-3}$ and $g(x) = \dfrac{2}{x+3}$ **(5 pts ea)**

A) Properly state the domain for each of $f(x)$ and $g(x)$.

B) $h(x) = f(x) + g(x)$. Determine the domain only for $h(x)$.

C) $j(x) = \dfrac{g(x)}{f(x)}$. Determine the domain only for $j(x)$

D) $k(x) = f(g(x))$. Determine the domain only for $k(x)$.

E) $m(x) = \sqrt{f(x) + g(x)}$. Determine the domain only for $m(x)$.

F) Find the formula only for $g(f(x))$.

III Solve for x. Graph solution on a well labeled number line. **(10 pts ea)**

A) $\dfrac{1}{3x-2} < 4$ B) $\left|\dfrac{x-2}{x+3}\right| \geq 1$ C) $\dfrac{-2x}{x+2} = x + 2$

IV Write as a piece-wise function: $f(x) = |2x + 1| - |3 - x|$ **(10 pts)**

V For each of the following, list the three items including the given item. (x, y) is the coordinate pair on the unit circle, Z is the arc length in radians, and the Greek letter alpha (α) is the angle in degrees. Draw the circle for each. (NOTE: You will draw a total of 6 circles!) **(25 pts total)**

A) Find (x, y) and α given: 1) $z = \dfrac{\pi}{3}$ 2) $z = \dfrac{5\pi}{6}$

B) Find (x, y) and Z given: 1) $\alpha = 135°$ 2) $\alpha = 300°$

C) Find Z and α given: 1) $\left(\dfrac{-1}{2}, \dfrac{-\sqrt{3}}{2}\right)$ 2) $\left(\dfrac{-\sqrt{2}}{2}, \dfrac{-\sqrt{2}}{2}\right)$

EXTRA CREDIT ..... **5 pts** .....

Given: $\begin{cases} f(x) = \{(1,3), (2,4), (3,1), (4,2)\} \\ g(x) = \{(1,4), (2,3), (3,2), (4,1)\} \\ h(x) = \{(1,2), (2,3), (3,1), (4,4)\} \\ k(x) = h(g(f(x))) \end{cases}$. Write the coordinate pairs which make up the function $k(x)$.

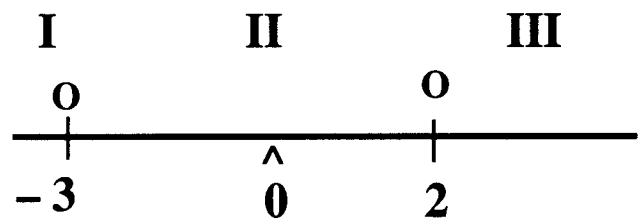
Mr. Mumaugh

Honors Trigonometry

Absolutely Right

$$\sqrt{\bigstar^2} = |\bigstar| = \begin{cases} -\bigstar & \text{if } \bigstar < 0 \\ \bigstar & \text{if } \bigstar \geq 0 \end{cases}$$

Solve and graph the solution set for: $\left|\dfrac{x-2}{x+3}\right| \geq \dfrac{1}{2}$



(1) Draw a number line. Mark significant positions (ie. when terms would be a zero.) label interval numbers using Roman Numerals.

Supply explicit reasons and/or explanations for each of the steps: 2a,2b,2c,...

(2) Consider interval I

a) $\left|\dfrac{-}{-}\right| = |+|$

b) $\dfrac{x-2}{x+3} \geq \dfrac{1}{2}$

c) $2x - 4 \leq x + 3$

d) $x \leq 7$

(3) consider interval II

a) $\left|\dfrac{-}{+}\right| = |-|$

b) $\dfrac{-(x-2)}{x+3} \geq \dfrac{1}{2}$

c) $-2x + 4 \geq x + 3$

d) $x \leq \dfrac{1}{3}$

(4) consider interval III

a) $\left|\dfrac{-}{-}\right| = |+|$

b) $\dfrac{x-2}{x+3} \geq \dfrac{1}{2}$

c) $2x - 4 \geq x + 3$

d) $x \geq 7$

(5) $x \leq 7$ and $x < -3$

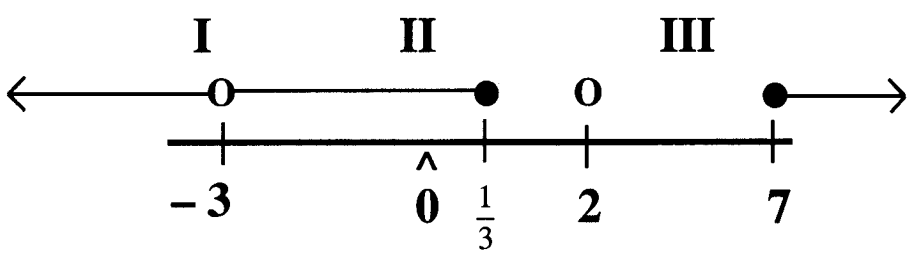
so _____

(6) $x > -3$ and $x \leq \dfrac{1}{3}$

so _____

(7) $x > 2$ and $x \geq 7$

so _____



Note: – 3 *is* the **left end point of interval** II and 2 *is* the **left end point** of interval III.

– 3 is not included because it would allow division by zero.

2 is not included because the proper solution's interval does not inlcude the number 2.

"Remember When" you knew some Algebra II

Mr. Mumaugh
Honors Trigonometry

Part I For each item in the following list, write a **brief** definition and give an example of its use.

A) member B) element C) Set-builder notation D) subset E) proper subset
F) equal sets G) null set H) union of sets I) intersection of sets J) integers
K) natural numbers L) rational numbers

Part II Given: $A = \left\{\sqrt[3]{-8},\ -\sqrt{3},\ 10,\ 3.14,\ 7^2,\ 2\tfrac{1}{2},\ \tfrac{132}{2}\right\}$, find the subset which contains...

A) natural numbers? B) integers? C) rational numbers? D) irrational numbers?

Given: $A = \left\{1.1,\ -3,\ \sqrt{25},\ \pi,\ \sqrt{7},\ \sqrt[3]{7},\ \tfrac{5}{3}\right\}$, find the subset which contains...

E) natural numbers? F) integers? G) rational numbers? H) irrational numbers?

Part III Find the solution set of each of the following. Graph the solution on a **number line**.

A) $(x-5)^2 = 10$ B) $5 - \frac{1}{2}x = 7$ C) $x^2 + 8x + 1 = 0$ D) $11 - 2(x+4) = 14(2-x)$
E) $(x-2)^2 = 49$ F) $x(x+3) + 2 = (x+1)(x+2)$ G) $x^2 = x$
H) $x(x+4) = 0$ I) $10x^2 = 8x$ J) $x^2 - 2x = 15$ K) $2x^2 - 4x - 30 = 0$
L) $5 - x^2 = 0$ M) $\dfrac{5x-2}{3} + \dfrac{2x+4}{4} = 2x - 1$ N) $\dfrac{1}{x-3} - \dfrac{1}{x+3} = \dfrac{6}{x^2-9}$
O) $x^2 + x - 2 > 0$ P) $(2x-3)(x+1)(x-2) < 0$
Q) $(2x-3)^2(x+1)(x-2) < 0$ R) $(2x-3)(x+1)^2(x-2) < 0$ S) $(2x-3)(x+1)(x-2)^2 < 0$

Part IV Solve each of the following inequalities. Graph each equation on its own number line.
Show the proper work!

1) $|x+4| + x > 3$ 2) $|x-3| + (x+4) < |-8|$ 3) $|x-3| + |x+4| < 8$
4) $|x| + |x| + x > 12$ 5) $\dfrac{|x-3|}{|x+4|} < 8$ 6) $|-x| + |-x| + 3x - 1 > 5$
7) $|x+2| - |x-3| \geq 3$ 8) $5 - |x-2| \geq 3$ 9) $2x + |3x+1| - |4x-5| \geq -10$
10) $\dfrac{|x+4|}{|x-3|} < 8$ 11) $\dfrac{|2x+1|}{|x-1|} < 2$ 12) $|2x-6| = |4-5x|$
13) $|2x-1| = |4x+3|$ 14) $|x^2| < |-4|$ 15) $|6-2x| > |8|$
16) $\dfrac{|x+1|}{|x-1|} > 2$ 17) $|2x-1| > x$ 18) $|x+4||x-3| < 8$
19) $|2x+5| < x+3$ 20) $|x+1| \cdot |x+1| - x^2 > 2$ 21) $|(x+1)(2x-3)| > 4$

Part V Write as piece-meal functions then sketch the function:

1) $a(x) = |x+2| + |x-1|$ 2) $b(x) = |2x+1| + 2|x-1|$ 3) $c(x) = |x-3| + (x+3)$

4) $d(x) = 2x - |x-1|$ 5) $e(x) = |x| + |x+1| - |x-1|$ 6) $f(x) = |x + |x+1||$

H = F + G List the ordered pairs for H.

7) $f(x) = \{(1,4),(2,3),(3,2),(4,1)\}$
$g(x) = \{(1,0),(2,2),(3,4),(4,6)\}$

8) $f(x) = \{(-2,4),(-1,2),(0,0),(1,2),(2,4)\}$
$g(x) = \{(-2,2),(-1,1),(0,0),(1,1),(2,2)\}$

Graph each function: 9) $f(x) = \begin{cases} x^2 & ; -2 \le x \le 1 \\ 1 & ; 1 < x \le 2 \end{cases}$ 10) $f(x) = \begin{cases} x & ; -3 \le x < 0 \\ 1 & ; 0 < x \le 3 \end{cases}$

Part VI For parts A, B, C: Find $f+g$, $f \cdot g$, $f(f(x))$, and $f(g(x))$

A) $f(x) = 6x+1$; $g(x) = 3x$ B) $f(x) = x^2 - 1$; $g(x) = (x-1)^2$ C) $f(x) = \dfrac{x+4}{x-2}$; $g(x) = x-2$

For parts D and E : Find $f(g(x))$ and $g(f(x))$

: D) $f(x) = \sqrt{x}$; $g(x) = 5 - x$ E) $f(x) = -x$; $g(x) = x^2$

F) 1. $f(x) = x+1$; $f(g(x)) = 4x - 2$ Find $g(x)$.

2. $f(x) = x+1$; $g(f(x)) = 4x - 2$ Find $g(x)$.

G) Given f(x) = {(1,4) , (2,3) , (3,2) , (4,1)} and g(x) = {(1,3) , (2,1) , (3,4) , (4,5)}.

Also given : h(x) = f(g(x)) ; i(x) = g(f(x)) ; j(x) = f(f(x)) ; and k(x) = g(g(x)).

List the ordered pairs in: G) h(x) H) i(x) I) j(x) J) k(x)

Part VII Given $A(x) = \dfrac{x}{x+1}$; $B(x) = \dfrac{x}{2x-1}$; $C(x) = \dfrac{3x+1}{x}$; $D(x) = \dfrac{x-1}{x+5}$ **and**

$H(x) = B(A(x))$; $I(x) = C(A(x))$; $J(x) = D(A(x))$; $K(x) = C(D(x))$; $L(x) = D(C(x))$; $M(x) = A(B(x))$

$N(x) = A(A(x))$; $O(x) = B(B(x))$; $P(x) = C(C(x))$; $Q(x) = D(D(x))$; $R(x) = A(B(C(x)))$

Describe the DOMAIN ONLY for each of the following:

1) $A(x)$ 2) $B(x)$ 3) $C(x)$ 4) $D(x)$ 5) $H(x)$

6) $I(x)$ 7) $J(x)$ 8) $K(x)$ 9) $L(x)$ 10) $M(x)$

11) $N(x)$ 12) $O(x)$ 13) $P(x)$ 14) $Q(x)$ 15) $R(x)$